

AD-A160 719

FORCES ON NEUTRAL ATOMS DUE TO ELECTROMAGNETIC FIELDS
(U) MASSACHUSETTS INST OF TECH CAMBRIDGE RESEARCH LAB
OF ELECTRONICS D E PRITCHARD 23 OCT 85
N00014-83-K-0695

1/1

UNCLASSIFIED

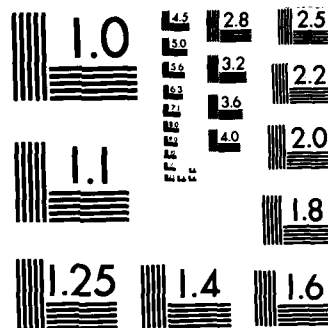
F/G 7/4

NL

END

FILMED

DTIC



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

12

ANNUAL SUMMARY REPORT

Forces on Neutral Atoms Due to Electromagnetic Fields

Office of Naval Research
Contract N00014-83-K-0695

covering the period
1 September 1984 - 31 August 1985

Submitted by:
David E. Pritchard

23 October 1985

DTIC
ELECTE
OCT 28 1985
S D
E

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Research Laboratory of Electronics
Cambridge, Massachusetts 02139

This document has been approved
for public release and sale; its
distribution is unlimited.

85 10 28 015

DTIC FILE COPY

AD-A160 719

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE

AD-416C 719

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION Unclassified		1b. RESTRICTIVE MARKINGS	
2a. SECURITY CLASSIFICATION AUTHORITY		3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution unlimited	
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE			
4. PERFORMING ORGANIZATION REPORT NUMBER(S)		5. MONITORING ORGANIZATION REPORT NUMBER(S)	
6a. NAME OF PERFORMING ORGANIZATION Research Laboratory of Electronics Massachusetts Institute of Technology		7a. NAME OF MONITORING ORGANIZATION	
6b. ADDRESS (City, State and ZIP Code) 77 Massachusetts Avenue Cambridge, MA 02139		7b. ADDRESS (City, State and ZIP Code)	
8a. NAME OF FUNDING/SPONSORING ORGANIZATION Office of Naval Research Department of the Navy		8b. OFFICE SYMBOL (If applicable)	
8c. ADDRESS (City, State and ZIP Code) 800 North Quincy Street Arlington, Virginia 22217		9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER N00014-83-K-0695	
11. TITLE (Include Security Classification) Forces on Neutral Atoms Due to Electromagnetic Fields		10. SOURCE OF FUNDING NOS. PROGRAM ELEMENT NO. PROJECT NO. TASK NO. WORK UNIT NO. NR 407-013	
12. PERSONAL AUTHOR(S) David E. Pritchard			
13a. TYPE OF REPORT Annual Summary Rep.		13b. TIME COVERED FROM 9/1/84 to 8/31/85	
		14. DATE OF REPORT (Yr., Mo., Day) 23 October 1985	
		15. PAGE COUNT 2	
16. SUPPLEMENTARY NOTATION			
17. COSATI CODES FIELD GROUP SUB. GR.		18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
19. ABSTRACT (Continue on reverse if necessary and identify by block number) Work by D. E. Pritchard and his collaborators is summarized here.			
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT UNCLASSIFIED/UNLIMITED <input checked="" type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS <input type="checkbox"/>		21. ABSTRACT SECURITY CLASSIFICATION Unclassified	
22a. NAME OF RESPONSIBLE INDIVIDUAL Kyra M. Hall RLE Contract Reports		22b. TELEPHONE NUMBER (Include Area Code) (617) 253-2569	
		22c. OFFICE SYMBOL	

ONR Progress Report 1 September 1984 - 31 August 1985

The major portion of our effort in 1984-1985 has gone into design and construction of a new large bore (3^{1/8}_{in.}) atom slower and trap which will use cryogenics both to produce ultra-low vacuums and to enable use of superconducting magnet technology. The vacuum and cryogenic dewar is under construction, the longitudinal magnets have been built (by us - after an unsuccessful attempt to find outside suppliers), and the trap magnet has been successfully tested. Considerable effort was also devoted to major renovations of our laboratory space including installation of a 18^{1/2}_{in.} hole to the newly acquired laboratory space below our laser lab - this will permit use of a vertical configuration for the apparatus, which is roughly 5 meters long. We hope to begin experiments on steady state slowing by Christmas. Early in the period some effort was devoted to measurements on slowing atoms in a magnetic slower using conventional magnets which we built in 1983-84.

Invited talks on trapping neutral atoms were given at the Gordon Conference on Spin Aligned Systems and at the International Conference on Physics of Electron and Atomic Collisions. Papers published include an article in Quantum Electronics and a contribution to the ICPEAC book of invited talks.



Date For 5 CRA&I <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 5 TAB announced 5 tification		By 5 t ibution /	Availability Codes	Avail and/or Special
Dist		2-1		

REPORTS DISTRIBUTION LIST FOR ONR PHYSICS DIVISION OFFICE
UNCLASSIFIED CONTRACTS

Director Defense Advanced Research Projects Agency Attn: Technical Library 1400 Wilson Blvd. Arlington, Virginia 22209	1 copy
Office of Naval Research Physics Division Office (Code 412) 800 North Quincy Street Arlington, Virginia 22217	2 copies
Office of Naval Research Director, Technology (Code 200) 800 North Quincy Street Arlington, Virginia 22217	1 copy
Naval Research Laboratory Department of the Navy Attn: Technical Library Washington, DC 20375	1 copy
Office of the Director of Defense Research and Engineering Information Office Library Branch - The Pentagon Washington, DC 20301	1 copy
U.S. Army Research Office Box 1211 Research Triangle Park North Carolina 27709	2 copies
Defense Technical Information Center Cameron Station Alexandria, Virginia 22314	12 copies
Director, National Bureau of Standards Attn: Technical Library Washington, DC 20234	1 copy
Director U.S. Army Engineering Research and Development Laboratories Attn: Technical Documents Center Fort Belvoir, Virginia 22060	1 copy
ODDR&E Advisory Group on Electron Devices 201 Varick Street New York, New York 10014	1 copy

Air Force Office of Scientific Research Department of the Air Force Bolling AFB, DC 22209	1 copy
Air Force Weapons Laboratory Technical Library Kirtland Air Force Base Albuquerque, New Mexico 87117	1 copy
Air Force Avionics Laboratory Air Force Systems Command Technical Library Wright-Patterson Air Force Base Dayton, Ohio 45433	1 copy
Lawrence Livermore Laboratory Attn: Dr. W. F. Krupke University of California P.O. Box 808 Livermore, California 94550	1 copy
Harry Diamond Laboratories Technical Library 2800 Powder Mill Road Adelphi, Maryland 20783	1 copy
Naval Air Development Center Attn: Technical Library Johnsville Warminster, Pennsylvania 18974	1 copy
Naval Weapons Center Technical Library (Code 753) China Lake, California 93555	1 copy
Naval Underwater Systems Center Technical Center New London, Connecticut 06320	1 copy
Commandant of the Marine Corps Scientific Advisor (Code RD-1) Washington, DC 20380	1 copy
Naval Ordnance Station Technical Library Indian Head, Maryland 20640	1 copy
Naval Postgraduate School Technical Library (Code 0212) Monterey, California 93940	1 copy
Naval Missile Center Technical Library (Code 5632.2) Point Mugu, California 93010	1 copy

Naval Ordnance Station 1 copy
Technical Library
Louisville, Kentucky 40214

Commanding Officer 1 copy
Naval Ocean Research & Development Activity
Technical Library
NSTL Station, Mississippi 39529

Naval Explosive Ordnance Disposal Facility 1 copy
Technical Library
Indian Head, Maryland 20640

Naval Ocean Systems Center 1 copy
Technical Library
San Diego, California 92152

Naval Surface Weapons Center 1 copy
Technical Library
Silver Spring, Maryland 20910

Naval Ship Research and Development Center 1 copy
Central Library (Code L42 and L43)
Bethesda, Maryland 20084

Naval Avionics Facility 1 copy
Technical Library
Indianapolis, Indiana 46218

END

FILMED

11-85

DTIC